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2. *Journey in Asia Minor.* By M. P. DE TCHIHATCHEF, Hon. F.R.G.S.

Communicated by SIR R. I. MURCHISON, V.P.R.G.S., &c. &c. &c.

Samsun, Sept. 15, 1858.

MY DEAR SIR RODERICK,—I am at last returned to Samsun, whence I started four months ago in order to explore those tracts of Pontus and Armenia which had not been visited before by any naturalist. My peculiar object was to fill up those empty white patches which are very numerous and more or less extensive on the best maps. The first, which I met with almost at the doors of Samsun, was the tract between the river Iris (*hodie* Yezil Irmak) and the line which marks the great road from Tokat to Amasia, and from the last city to Samsun. After having explored this tract, which I found full of lofty mountains, the passage of which was rather difficult at the end of May, I went to Niksar, and followed the Germeli-tchai (Lycus of Strabo, a large affluent of the Iris) to Chabhana-Karahissar, where I had an opportunity of examining very interesting alum mines, which, were they worked in a less barbarous way, and particularly on a larger scale, might provide Europe with most valuable alum, for almost all the trachytic mountains of the country (there is no trace of *cretaceous* deposits, as marked on your geological map of Europe, and that of Dumont) are full of this useful mineral, which forms nests or patches in the trachyte very easily to be worked without any complicated subterraneous labour.

As all the extensive country between Chabhana-Karahissar and the shore of the Black Sea is left blank on the map of Mr. Kiepert, and was, in fact, until my present exploration, a true terra-incognita where the geographers place arbitrarily the chain of the *Paryadrès*, mentioned by Strabo as being situated somewhere between Trapezunt and Amisus (Samsun); in consequence, I determined to march northward from Chabhana-Karahissar, and to advance in that direction till I descried the sea. I spent ten days in crossing the high trachytic mountains (between 9000 and 10,000 feet approximatively), and I descended by rapid declivities to Kerasun. I shall be able to give the true altitudes when my numerous hypsometrical measures are calculated. From this city, the mother country of the cherry-tree, which Lucullus transported for the first time to Europe, I went to Tripolis (*hodie* Tireboli), whence I ascended the river Marchottchai (which falls into the Black Sea near Tripolis) to Gumuchhane, and pushed on to the south to the town of Erzindjan (called equally Erzingian), situated on the Euphrates, in order to get an uninterrupted section from that classic river to the Black Sea, a section running almost from s. to n., and having a length of near two degrees. From Erzindjan I ascended the Euphrates to its sources near Erzerum. After a stay of ten days in the capital of Armenia, I undertook the exploration of the lofty and perfectly unknown chain (at least to geologists, botanists, and zoologists) which borders to the south the valley of the Euphrates between the meridians of Erzerum and Erzindjan. At any other time the visit to these mountains would have been less difficult than at the present moment, on account of the alarming progress which the predatory Kurdisch tribes are making every day in the whole eastern part of the peninsula; so that, if the Turkish Government does not succeed in stopping their encroachments and in checking their boldness, in a very short time the whole valley of the Euphrates will be in the hands of those classic robbers whose undaunted spirit and ferocity were experienced more than 2000 years ago by Xenophon, when, in his famous retreat of the 10,000 Greeks, he had to cross the country of the *Carduchi*. There is no doubt that one of the reasons which favour their extension and depredations is the increasing weakness of the *sick man* of the

Emperor Nicholas ; a man so truly sick indeed that, according to all I had opportunity of observing during ten years, he is certainly very near his last moments, in spite of the galvanic skill of those who pretend to re-animate dead bodies. Independently of this reason, there is at the present moment another, which revealed itself during the last year by the unusual boldness not only of the Kurds of Armenia, but also of their brothers and of the Arabs of Mesopotamia, Bagdad, &c. I have the strongest reason to believe that the Indian insurrection produced an electric impression upon the whole of the Mahometan family ; so that, if this insurrection had really succeeded, the consequences of this triumph over England would have been most alarming to Christendom and to the future civilization of the whole continent of Asia. Instead, therefore, of reducing the Indian catastrophe to the petty proportions of the affair of a single nation, and looking at it with the eyes of national jealousy and rivalry, if we consider this important event from a higher and more philosophical point of view, we must necessarily come to the conclusion that all civilized Europe is deeply interested in the success of the British arms in India.

In spite of the great difficulties which the Kurds opposed to my exploration of the large chains of Bingöldagh (literally, "mountain of thousand lacks"), I was, however, so fortunate as to succeed in my enterprise. Nevertheless, I regret very much not to have been able to make the interesting researches you pointed out to me in your last letter (six months ago) at the moment of my departure from Paris for Constantinople, viz., the researches after the remnants of fossil elephants in the country of Mush. When on the Bingöldagh I was certainly very near Mush, and could have descended into that tract by the direct road which goes from Erzerum through the Bingöldagh ; but, according to my custom, I always avoid a public road, and prefer finding out a new one for my private and exclusive use. Therefore I intended to turn towards Mush by descending from the Dudjukdagh. Unfortunately, there was no possibility of crossing the country in that direction, for two Kurdish tribes were squabbling there, and waging one against the other a most bloody war. Consequently I should have been obliged to return to the Bingöldagh in order to take there the direct road to Mush. This would have caused me a great loss of time, and, moreover, it would have forced me to cross twice the same dangerous country ; whereas before me I had still a large tract of terra-incognita. In consequence, I descended the northern declivity of the lofty ridge which forms the southern boundary of the valley of Euphrates, and returned to Erzindjan, which two months ago I had reached when coming from the opposite side. From Erzindjan I turned eastward, in order to explore the superior course of the river Iris (which, as a glance on my map or on that of Mr. Kiepert will show you, is equally a perfectly unknown region) ; there, also, I had the unexpected pleasure to meet large parties of my old friends the Kurds. Their presence is by no means calculated to facilitate scientific explorations, and explains the reason why a country situated not very far from the town of Tokat, which is so frequently and so easily visited by European travellers, should have remained till now almost entirely unknown. The valley where the Iris has its sources, and which this river crosses from E. to W.N.W., is one of the most picturesque and fertile tracts of Asia Minor—beautiful forests of the rare species of *Quercus ægilops* covering a large part of it. The number of villages, however, is very considerable (suffering more or less from the depredations of the Kurds). The valley is bordered on both sides by lofty trachytic mountains, except certain tracts where the declivities of those ridges are covered by large masses of limestone charged with nummulites (generally stratified, and having the strata more or less disturbed). I followed the Iris to Tokat, after having examined the ruins of the celebrated Camana Pontica (near the miserable village Gunck), and then proceeded by

Amasia to Samsun. Now, for the first time in four months, I am comfortably settled under a roof (till this moment my tent was my only house), for I am in the house of the English Consul, my old friend, whose hospitality I was accustomed to enjoy during the ten years I rambled through Asia Minor. I had the pleasure to find at Samsun all the ponderous boxes (no less than fourteen, full of minerals, plants, &c.) which I had sent from different points of the countries I had crossed, and I am now occupied in investigating and packing up these glorious trophies, painfully conquered during my adventurous expedition. As soon as this business is finished, and my treasures embarked for Marseilles, I will remount my horse, in order to proceed to Constantinople, following all the zig-zag of the shore. Though this journey will require a ride of at least twenty-five days, I consider it quite a "parti de plaisir," compared with my rambles through the inhospitable countries I have crossed.

Believe me, my dear friend, yours most faithfully,

P. DE TCHIHATCHEF.

3. *Sudden Rise of the Sea at Heligoland.* By Dr. E. HARMSSEN, M.D.

Communicated by SIR RODERICK I. MURCHISON, &c. &c. &c.

Heligoland, June 16th, 1858.

REQUESTED by the Governor, Major Pattinson, I send a description of a phenomenon that took place in the island of Heligoland, in lat. $54^{\circ} 145' N.$, long. $7^{\circ} 53' E.$ of Greenwich, on the 5th of June.

At 4:20 P.M. of the above date, during the finest and mildest spring weather, a cloudless sky and the warmest sunshine, the thermometer at $73^{\circ} F.$, with a slight breeze from the E.N.E., the sea around this island in the short time of one quarter of a minute rose 6 feet, remaining about 3 minutes at this elevation, and during 10 minutes receded gradually to its former level; no noise or sudden gust of wind accompanied this phenomenon, nor was a wave formed whilst it lasted.

On Sandy Island, situate about a mile from this, the main island, and where the beach rises very gradually, the phenomenon took place under somewhat different circumstances; there the sea did not rise in so unusual a manner, but a large wave approaching from S.E. rolled with great force and speed, as if driven by a gale, towards the shore, where breaking, it ran up the beach a distance of 70 feet. This first large wave was followed by three smaller ones, which meeting each other in the course up and down the beach, created a surf which principally on the reefs of rock was very strong, covering them with foam in a manner as it is seen only during a storm.

At about $\frac{1}{2}$ past 4 the wind changed to the S.E., and increased to a moderate breeze till 5 o'clock, the time of high-water, the horizon became clouded, and the oppressive heat towards evening made a thunderstorm very probable.

At 8:35 and 8:50 P.M. the phenomenon re-occurred in a similar manner as in the afternoon; in both instances a wave of the height of 5 feet rolled from west to east with great rapidity and noise towards the island; in both instances the large wave was followed by three or four smaller ones. The approaching of all these waves could be observed for two or three minutes, as they, rolling over the far extending reefs of rock, covered them with foam; the wind still blowing a fresh breeze from S.E.

During this, the water rose about 4 feet at the beach of this land, remained so for two minutes, and then in a time of four minutes receded to its former level.

In the course of the night there were no repetitions of the phenomenon, but